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ABSTRACT

Computers can be used in a variety of ways in the social studies classroom: (1) as a productivity tool to relieve the teacher of the many bookkeeping tasks and allow for more time to be spent on instructional tasks; (2) in business applications such as data base files, electronic spreadsheets, word processing, computer graphics, and to store large amounts of information that would be unwieldly otherwise; and (3) as a tool for individualized tutoring and in teaching the higher levels of learning such as problem solving and decision making. Research on effective classroom use of computers is cited. However, the full potential of instructional computing will not be realized until educators take the time to discover the power and possibilities of this technology. (SM)

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THE ROLE OF THE COMPUTER IN THE TEACHING OF SOCIAL STUDIES

by

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In the last five years, the computer has had such a significant impact on public education in Canada that a large proportion of school budgets has been spent to ensure that students will be able to reap the full benefits of this new technology. As the popularity of the computer has spread, it has been accepted in most of the core subject areas. The notable exception is social studies.

Two questions that can be asked of any teaching innovation are whether to implement the changes into the curriculum and in what ways will traditional methods of teaching be affected? Because social studies is a discipline which deals with many abstract concepts and subjective judgments which are generally believed to be outside of the computer's range of abilities, it has been unjustly criticized by many teachers as ineffective in the classroom. This interpretation is partly a result of inadequate teacher training in the use of computers as well as a low priority being placed on development of quality computer courseware for social studies.

The computer has a great variety of applications in the classroom. It can be used as a productivity tool that can release the teacher from many of the mundane bookkeeping tasks which must be performed every day. Students can also use the computer as a tool for maintaining records, analyzing data or preparing reports. As an instructional tool, educational software is available which transforms the computer into an individualized tutor that has an infinite abundance of patience.

The Computer as Tool

Many business applications exist which can prove to be effective in the social studies classroom for both the teacher and the student. For students, a data base can be used for storing and organizing large amounts of information which would normally be difficult to manage. This data can be organized in various ways to allow a number of different observations to be made. The students can become actively involved in the process of data interpretation which may otherwise seem too contrived and too complex (Hunter, 1983). For example, a geography class could gather and enter information on various regions of the country. Relationships could be developed between categories such as elevations, rainfall, vegetation, population and climate (Olds & Dickenson, 1985). Using this data, the students could make a number of related observations such as determining the effect of rainfall on vegetation. If the data base was sorted according to amount of rainfall, students could quickly determine what forms of vegetation thrive in very wet climates compared to dry ones. A printer could then be used to generate a report for the student's notes.

Computers can produce accurate graphs and charts using information located in electronic spreadsheets. Spreadsheets are programs that can store and manipulate large quantities of numeric data. Software is available that can create a variety of graph forms which can make interpretation of data more meaningful to the students. Many people find it easier to understand the relationships between statistics and other data if they are presented graphically, rather than in a body of text or a linear table. In addition, the students must make decisions relating to the format and design of the

computer generated graphics; these choices aid in the development of effective decision-making skills (Hunter, 1983).

Teachers can also take advantage of these types of business software. Student records, such as personal information and teacher comments, can be stored on data base programs. The spreadsheet can be used to maintain a student grade file. Throughout the year, course marks can be recorded and formulas within the spreadsheet can perform calculations, such as weighted averages and class averages. As new marks are added to the file, the computer instantly updates all of the calculated grades. Students can easily be added to or deleted from the list and paper reports can be produced on a printer. The uses of the spreadsheet and data base are limited only by the creativity of the teacher. Commercial programs are also available for maintaining mark files which perform other specialized functions such as statistical calculations and histograms. Programs such as these can allow the teacher to devote more time to teaching and less to paperwork.

Many programs can be used to create materials for the classroom. A word processor has the ability to produce student handouts quickly and easily. Such handouts are also highly readable. These documents can be stored on a magnetic disk, which makes subsequent revisions much simpler, as the entire body of text need not be entered a second time; revision is accomplished simply by editing the original document. Other programs can produce customized crossword puzzles and word search games. These puzzles are highly motivating and make excellent devices for review. Allowing students to make their own puzzles on a specific subject would encourage an intensive review of the material for that student and produce a puzzle which might be suitable for use by the rest of the class.

The Computer as Tutor

Educational software is another medium which can assist the teacher in the classroom. This type of program is used to teach ideas, concepts and/or skills. There are three basic types of educational software: drill and practice, tutorials and simulations. Drill and practice programs are simply electronic worksheets which emphasize rote memorization of facts. This form of software is probably the least effective means of using computers for instruction. Only marginally better are tutorials. These programs teach a body of information, usually facts, and then test the user to determine how much has been learned. Both of these types of software are little better than electronic page turners. Simulations seem to be the best way to utilize the power of the computer in teaching. A simulation presents a situation and then allows the user to react to it. Through the interpretation and manipulation of choices entered by the user, the computer can create a number of different scenarios. The final outcome of the simulation can then be seen to be a direct result of the decisions made by the user. This tends to personalize the experience for the student, making the learning more meaningful. Simulations are useful in presenting situations which would be dangerous or difficult to engage as direct experiences, such as some chemistry experiments, flying an airplane or directing the economy of a large nation. In the classroom, students can experience situations which would not normally be feasible or cost effective. Not only can this type of program teach content-based facts, it is very effective in developing students' problem solving skills as well as creating a "feel" for the situation (Alessi & Trollip, 1985).

Simulations usually deal with one small aspect of a particular subject. There are thousands of commercial educational programs available on the market today, although only a very small percentage are suitable as supplementary material for a course. Much of the problem results from programmers not implementing sound educational methods in their software. Alberta Education (1986) publishes a listing of recommended software in most subject areas. Again, the exception is social studies. This catalogue is updated yearly as new software becomes available and is evaluated. Because very little, if any, of the recommended software in the catalogue can be used effectively in the social studies classroom, the teacher must either evaluate software on an individual basis using a variety of sources or create his or her own programs.

Programming is an activity that few teachers have the skill or the time to adequately perform. The available computer languages are largely inappropriate for teachers; they require a large time investment and are difficult to edit. Authoring languages can reduce the amount of time required for programming, but are usually too restrictive and tend to stifle the creativity of the programmer. Graphics, sound and animation are extremely difficult to integrate into a program, but without them, the software can be lifeless and dull (Marsh, 1986). These limitations are largely responsible for the small number of teachers who write their own programs, which, if easier to produce, could be customized for the individual classroom situation.

Social Studies Software Review

It is difficult for a social studies teacher to find software that can be used for more than just "filling time." Although there is a large number of programs available today, many are of dubious educational value. The

following is a short review of two simulations that I feel are examples of the great disparity in software quality.

"Crisis" (Keran, 1982) is a program that simulates the impending invasion of West Berlin by Soviet forces. As the situation escalates, the user is prompted to make choices from a list of possible reactions by the United States. Each list includes a range of reactions from quiet diplomacy to massive military intervention. If the user makes choices reflecting a diplomatic approach, the crisis continues to escalate. But, by mobilizing a large and aggressive military force, the situation quickly stabilizes and the simulation ends. From a technical standpoint, this program is simplistic and uses few motivational devices. It has no graphics, color or sound; only text screens are used to tell the story. Pedagogically, this program is filled with imperialist bias and could create a highly distorted interpretation of world politics. A student could also be led to believe that the only way to solve disagreements is with an ever increasing level of aggression and violence.

At the other end of the software spectrum is what I feel to be one of the best social studies simulations available today. "Where in the World is Carmen Sandiego" (Carlston, 1985) is a simulation that places the user in the role of detective. In each of the many scenerios, a priceless artifact is stolen from a country of the world. The detective's job is to track and arrest the thief.

The beauty of this program is that to trace the thief, the detective must use deductive reasoning to interpret the supplied clues. Each clue deals with some aspect of physical geography (rivers, crops and population), types of currency, flags of the world, indigenous animals, world leaders and religions.

A short description of each country visited by the detective is displayed with a color graphic of some aspect of the countries' geography. The detective will find that as the game's level of difficulty progressively increases, he or she must resort to using outside reference materials to understand many of the clues. This program utilizes animation and music to add the motivation of a video game to the simulation. It can encourage students to learn many facts about the world as well as teaching them to develop problem solving, research and deductive reasoning skills.

Effectiveness in the Classroom

The effectiveness of the computer as an instructional medium must be assessed before any rational decision can be made on implementation in the schools. A number of studies have been carried out in an effort to assist in making this type of assessment. One such study (Post, 1985) involved an economic simulation which covered a current lecture topic. One group was to use the computer simulation, another was to attend lectures and was also responsible for a number of related take-home assignments while the third group attended lectures only. The study found that the lecture-only group scored lower than the others, but little difference was displayed between the computer and the take-home groups.

The significant finding of this study was that while there was little test score difference between these last two groups, the amount of time the computer students required to learn the concept was substantially lower than the take-home/lecture group. In other words, the same level of comprehension was attained by the computer group with less time and effort by both the teacher and the students. This study indicates that effective lower-order

learning is possible using computer-based instruction, but there is no indication whether learning took place at the higher levels.

In another study (Marsh, 1986), a simulation on the War of 1812 was used with Grade 7 students. The computer group used the simulation to learn the required material while the control group attended the standard class presentations. At the conclusion of the study, a common exam was written by all students. A "significant difference" between the groups became apparent after the test had been administered. The computer group scored higher on the multiple choice questions which tested for lower order knowledge-based comprehension. There was no difference between the groups on the higher order questions. As in the previous study, the total time to cover the material was substantially lower for the computer group. It was also found that some students went through the computer material more than once because it was fun: fun which may have led to improved learning. A question was posed to each of the computer students: "Do you think the computer helped you to learn the material and why (sic)?" Some of the responses were: "You can go at your own pace."; "It mixes fun with work."; "You could just look at it and learn it." Study results and student responses such as these indicate that the computer does have a positive effect on student learning.

Criticisms of Computers in the Schools

One of the problems with computer learning which many critics feel to be the key issue is that computers have a dehumanizing effect on the students. I would counter that argument by pointing out that as an instructional medium, the computer is no more dehumanizing than a textbook, a filmstrip or any of the other physical tools used by a teacher in the classroom. Certainly, if

the computer were the teacher's only method of instruction this might be a valid point; but, ideally, the computer is a powerful addition to the creative teacher's supply of resources; the traditional methodology of regular teacher/student interaction can be combined with a new level of individualized instruction that would otherwise be very difficult to attain.

Another criticism is that computers are being used to force-feed students with a stream of facts and that no real learning is taking place. Some critics argue that students need to learn problem-solving skills and develop the ability to think critically to succeed in the modern world. Dr. Jim Cummins, in an Edmonton Journal article ("Challenge Seen In Classroom," 1986), maintains that we are at a crucial point in the development of computer education. He fears that computers may become "expensive, electronic ditto sheets" that teach nothing but facts: facts which would not adequately prepare students for life in the modern world.

Dr. Cummins' observations may be valid, but the computer itself cannot be blamed; computers only do what they are instructed to do. The prevailing educational philosophy dictates what is considered to be important in the classrooms. If the learning of facts is the existing instructional priority, the ways in which the computer is used will obviously reflect this philosophy. If problem solving and critical thinking are to be emphasized, then software which relates to this philosophy would be implemented. The computer has the capability to perform many functions; it merely needs direction.

There is a place for the computer in social studies. It has the potential to be the single most important educational innovation since the printing press. But this potential might never be realized unless educators take the time to discover the power and possibilities that this machine has to

offer. In no other area of teaching is this more important than social studies. I do not advocate the computer as an educational panacea, nor do I believe that computers are the answer for all teachers; but, I do believe that in most classrooms, the computer can serve in some capacity and in so doing, improve the quality of social studies education.

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